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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/625,811 | 07/23/2003 | Christopher L. Chua | D/A3316 | 7775 |

7590 03/27/2006

Patent Documentation Center
Xerox Corporation
Xerox Square 20th Floor
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Rochester, NY 14644

| EXAMINER | |
|---|---|
| NGUYEN, TUAN N | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2828 | |

DATE MAILED: 03/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/625,811 | CHUA, CHRISTOPHER L. | |
| | Examiner | Art Unit | |
| | Tuan N. Nguyen | 2828 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *17 January 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14,16,18 and 20-32* is/are rejected.

7)☒ Claim(s) *15,17 and 19* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/31/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or non-obviousness.

4. Claims 2-4, 9-11, 13-14, 18-20, 23-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thornton (US 6208681).

With respect to claims 2, 4, 13, 20, 26, Thornton '681 discloses the above, the claim further require a high gain region positioned between first and second VCSEL to enhance mode coupling between first and second VCSEL. Thornton '681 did not discretely disclose the high gain region between first and second VCSEL, however Thornton '681 did disclose the dopants or ion implantation (Col 5: 30-40; 55-67)(Col 10) that could increase the high gain region to enhance mode coupling, as disclosed by applicant's specification sections [0022-0023].

With respect to claims 3, 14, 18, 19, 25 Thornton '681 discloses the contact provide the current to the gain coupling region, or simultaneously pump current through first and second

VCSEL. (Col 2: 40-50)(Col 7: 15-400) (Col 8: 60-67) (Col 1)(Fig 14, 15) show electrical contact (Fig 9: #132 and bottom electrode #134)(Col 7: 45-50) it is inherent that the VCSEL array has common electrode contact that enabling simultaneous lasing.

With respect to claims 9-11, the claims further require a plurality holes between the laser aperture. It has been held that where the general conditions of a claim are disclosed in the prior art, that the mere duplication of the essential working parts of a device involves only routine skill in the art. *St Regis Paper Co. v. Bemis Co., 193 USPQ 8.*

With respect to claims 23-24, Thornton '681 discloses the method of lateral oxidation, contact and doping to form high gain region (Col 6-7).

With respect to claim 27-32, (Col 5: 1-67) discloses the reflecting mirror structure and DBR to change the phase matching. It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, in this case the amount of doping in substrate or mirror layer to form higher gain or loss region. *In re Aller, 105 USPQ 233.*

***Allowable Subject Matter***

5. Claims 15, 17 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The references of the record fail to teach or suggest:

**Claim 15:**

A high gain coupling region including high gain region coupling at least one opening in first oxide wall to the corresponding opening in the second oxide wall, the high gain coupling region also coupled to the contact provides current to high gain coupling region thereby facilitating mode coupling between first and second VCSEL.

**Claim 17:**

A plurality of high gain coupling regions including first high gain region coupling at least one opening in first oxide wall to second oxide wall and a second high gain region coupling second opening in first oxide wall to opening of the third oxide wall.

**Response to Argument/**

6. Applicant's arguments filed on 01/17/2006 have been fully considered but they are not persuasive. The examiner read the claims given their broadest reasonable interpretation consistent with the specification.

With respect to Applicant's remark on pages 2-3, Thornton structure does not enable mode coupling or mode locking between first and second VCSEL; examiner stand that the as the waves come out from the VCSELs they coupled and inherently lock to one another because the waves come from the same identical array of VCSEL that have the same bottom mirrors, active layer, top mirrors. In addition, claims 1,12, and 22 respectively recite "*evanescent waves output by the first VCSEL cause mode coupling between the first and second VCSEL*", "*evanescent waves from the first VCSEL to interact with an active region of the second VCSEL*" and "*evanescent waves from the first laser aperture will induce mode locking between the first laser aperture and the second laser aperture*", not evanescent fields to cross over into adjacent

VCSEL active regions and induce mode locking as describe by Applicant; it is not proper to read limitations appearing in the specification into the claim when these limitations are not recited in the claim.

With respect to Applicant's remark on pages 2-3, that Thornton neither describe or suggest simultaneous providing current to multiple lasers; the examiner stand that Thornton shows and discloses the multiple array of VCSEL (Col 1)(Fig 14, 15) having electrical contact (Fig 9: #132 and bottom electrode #134)(Col 7: 45-50) it is inherent that the VCSEL array has common electrode contact that enabling simultaneous lasing; as admitted by applicant on page 4 that it may possible to simultaneously address two lasers. Applicant goes further by explaining detail structures of Thornton that would differentiate with the current application. It is noted that the features upon which applicant relies are not recited in the rejected claim(s). It has been held that a recitation of the function of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art.

With respect to Applicant's remark on page 4-5, that Thornton dopant is a standard procedure and nothing to do with creating a high gain region, and hindsight reconstruction is impermissible. It needs to recognized that any judgement on obviousness is necessary reconstructed based upon hindsight reasoning, so long is within the level of ordinary skill and does not only take knowledge from the applicant's disclosure takes into account; in this case Thornton does disclose the desire optical gain can be obtain via doping (Col 5: 30-45).

***Conclusion***

7. The prior art made of record and relied upon is considered pertinent to applicant's discloses.

Chua et al. (US 6304588), Chua et al. (US 6674090), Chua et al. (US 6548908), Thornton (US 5978408), Guilfoyle et al. (US 6959027) discloses plurality VCSEL with coherent mode locking (ABSTRACT), and Phase-coupled two-dimensional AlGaAsGaAs vertical cavity surface emitting laser array – shows in figure 1 the coupling of evanescent waves to the next VCSEL

8. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP 706.07. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

***Communication Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan N Nguyen whose telephone number is (571) 272-1948. The examiner can normally be reached on M-F: 7:30 - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harvey Minsun can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tuan N. Nguyen

MINSUN CHARVEY
PRIMARY EXAMINER